

WHAT IS CLAIMED IS:

- 1 1. A method comprising:
2 receiving information indicating a need to change an amount of data being
3 transmitted through a first media access control (MAC) device to a
4 client of the first MAC device;
5 forming a message including an indication to a second MAC device to change
6 a rate at which the second MAC device transmits data; and
7 transmitting the message to the second MAC device over a network.
- 1 2. The method of claim 1 wherein the network is a metropolitan area network
2 (MAN).
- 1 3. The method of claim 1 wherein the network is a resilient packet ring (RPR)
2 network.
- 1 4. The method of claim 1 wherein the network includes a first datapath for
2 transmitting data from the first MAC device to the second MAC device, and wherein
3 the network includes a second datapath for transmitting data from the second MAC
4 device to the first MAC device.
- 1 5. The method of claim 1 wherein the message is a resilient packet ring (RPR)
2 fairness message.
- 1 6. The method of claim 1 further comprising:
2 determining an extent to which a data buffer associated with the client of the
3 first MAC device contains data; and
4 preparing the information indicating the need to change the amount of data
5 being transmitted through the first MAC device to the client of the first
6 MAC device based on the extent to which the data buffer associated
7 with the client of the first MAC device contains data.
- 1 7. The method of claim 6 further comprising:
2 transmitting, to the first MAC device, the information indicating the need to
3 change the amount of data being transmitted through the first MAC
4 device to the client of the first MAC device.

1 8. The method of claim 1 wherein the message further includes a MAC device
2 address.

1 9. The method of claim 8 wherein the MAC device address corresponds to
2 one of the first MAC device, the second MAC device, and another MAC device.

1 10. The method of claim 1 wherein the indication to the second MAC device
2 to change the rate at which the second MAC device transmits data includes at least
3 one of: a MAC device address, a data transmission rate, a ramp factor, and a flag.

1 11. The method of claim 1 wherein the indication to the second MAC device
2 to change the rate at which the second MAC device transmits data includes a data
3 transmission rate, the method further comprising:
4 determining the data transmission rate.

1 12. The method of claim 11 wherein the determining the data transmission
2 rate further comprises at least one of:
3 calculating the data transmission rate;
4 selecting a value for the data transmission rate; and
5 determining a ramp factor.

1 13. The method of claim 1 further comprising:
2 transmitting the message from the second MAC device to a third MAC device.

1 14. The method of claim 1 wherein the first MAC device is part of a first
2 resilient packet ring (RPR) station and wherein the second MAC device is part of a
3 second RPR station.

1 15. The method of claim 1 wherein the information indicating the need to
2 change the amount of data being transmitted through the first MAC device to the
3 client of the first MAC device includes at least one of: a data transmission rate, a
4 counter value, a message indicating that a buffer threshold has been exceeded, and a
5 signal from the client of the first MAC.

1 16. The method of claim 1 wherein:
 2 the information indicating the need to change the amount of data being
 3 transmitted through the first MAC device to the client of the first MAC
 4 device further comprises at least one of: information indicating the
 5 need to reduce the amount of data being transmitted, and information
 6 indicating the need to increase the amount of data being transmitted;
 7 and
 8 the indication to the second MAC device to change the rate at which the
 9 second MAC device transmits data further comprises at least one of: an
 10 indication to the second MAC device to reduce the rate at which the
 11 second MAC device transmits data, and an indication to the second
 12 MAC device to increase the rate at which the second MAC device
 13 transmits data.

1 17. The method of claim 1 encoded in a computer readable medium as
 2 instructions executable on a processor, the computer readable medium being one of an
 3 electronic storage medium, a magnetic storage medium, an optical storage medium,
 4 and a communications medium conveying signals encoding the instructions.

1 18. An apparatus comprising:
 2 a first media access control (MAC) device operable to be coupled to a
 3 network, the first MAC device including control logic configured to
 4 prepare a message for transmission on the network including an
 5 indication to change a rate at which another MAC device transmits
 6 data; and
 7 a MAC client coupled to the first MAC device and including:
 8 a buffer for storing data transmitted to the MAC client; and
 9 buffer control circuitry configured to provide information about an
 10 amount of data stored in the buffer.

1 19. The apparatus of claim 18 wherein the network is a metropolitan area
 2 network (MAN).

1 20. The apparatus of claim 18 wherein the network is a resilient packet ring
2 (RPR) network.

1 21. The apparatus of claim 18 further comprising:
2 a second MAC device, wherein the second MAC device is the another MAC
3 device;
4 a first datapath coupled between the first MAC device and the second MAC
5 device, the first datapath for transmitting data from the first MAC
6 device to the second MAC device; and
7 a second datapath coupled between the first MAC device and the second MAC
8 device, the second datapath for transmitting data from the second
9 MAC device to the first MAC device.

1 22. The apparatus of claim 21 wherein the first MAC device is further
2 operable to transmit the message to the second MAC device.

1 23. The apparatus of claim 21 wherein the second MAC device is configured
2 to transmit the message to a third MAC device.

1 24. The apparatus of claim 21 wherein the first MAC device is part of a first
2 resilient packet ring (RPR) station and wherein the second MAC device is part of a
3 second RPR station.

1 25. The apparatus of claim 18 wherein the message is a resilient packet ring
2 (RPR) fairness message.

1 26. The apparatus of claim 18 wherein the buffer control circuitry is coupled
2 to the control logic, and wherein the control logic is further configured to use the
3 information about the amount of data stored in the buffer to determine the indication
4 to change the rate at which another MAC device transmits data.

1 27. The apparatus of claim 18 wherein the message further includes a MAC
2 device address.

1 28. The apparatus of claim 27 wherein the MAC device address corresponds
2 to one of the first MAC device and the another MAC device.

1 29. The apparatus of claim 18 wherein the indication to change the rate at
2 which another MAC device transmits data includes at least one of: a MAC device
3 address, a data transmission rate, a ramp factor, and a flag.

1 30. The apparatus of claim 18 wherein the control circuitry is further
2 configured to determine at least one of a data transmission rate and a data
3 transmission rate ramp.

1 31. The apparatus of claim 18 wherein the information about an amount of
2 data stored in the buffer includes at least one of: a data transmission rate, a counter
3 value, a message indicating that a buffer threshold has been exceeded, and a signal
4 from the client of the first MAC.

1 32. The apparatus of claim 18 wherein MAC client further comprises packet
2 processing circuitry coupled to the buffer.

1 33. The apparatus of claim 32 wherein the packet processing circuitry
2 includes the buffer control circuitry.

1 34. The apparatus of claim 18 wherein the indication to change the rate at
2 which another MAC device transmits data further comprises at least one of an
3 indication to reduce the rate at which another MAC device transmits data, and an
4 indication to increase the rate at which another MAC device transmits data.

1 35. An apparatus comprising:
2 a first media access control (MAC) device operable to be coupled to a
3 network, the first MAC device including:
4 control logic configured to prepare a message for transmission on the
5 network including an indication to change a rate at which
6 another MAC device transmits data;
7 a buffer for storing data transmitted to a MAC client; and
8 buffer control circuitry configured to provide information about an
9 amount of data stored in the buffer.

1 36. The apparatus of claim 35 wherein the network is at least one of a
2 metropolitan area network (MAN) and a resilient packet ring (RPR) network.

1 37. The apparatus of claim 35 further comprising:
2 a second MAC device, wherein the second MAC device is the another MAC
3 device;
4 a first datapath coupled between the first MAC device and the second MAC
5 device, the first datapath for transmitting data from the first MAC
6 device to the second MAC device; and
7 a second datapath coupled between the first MAC device and the second MAC
8 device, the second datapath for transmitting data from the second
9 MAC device to the first MAC device.

1 38. The apparatus of claim 35 wherein the message is a resilient packet ring
2 (RPR) fairness message.

1 39. The apparatus of claim 35 wherein the buffer control circuitry is coupled
2 to the control logic, and wherein the control logic is further configured to use the
3 information about the amount of data stored in the buffer to determine the indication
4 to change the rate at which another MAC device transmits data.

1 40. The apparatus of claim 35 wherein the message further includes a MAC
2 device address.

1 41. The apparatus of claim 35 wherein the indication to change the rate at
2 which another MAC device transmits data includes at least one of: a MAC device
3 address, a data transmission rate, a ramp factor, and a flag.

1 42. The apparatus of claim 35 wherein the control circuitry is further
2 configured to determine at least one of a data transmission rate and a data
3 transmission rate ramp.

1 43. The apparatus of claim 35 wherein the information about an amount of
2 data stored in the buffer includes at least one of: a counter value and a signal
3 indicating that a buffer threshold has been exceeded.

1 44. The apparatus of claim 35 further comprising:
2 a MAC client coupled to the first MAC device, the MAC client including
3 packet processing circuitry operable to receive data from the buffer.

1 45. The apparatus of claim 35 wherein the indication to change the rate at
2 which another MAC device transmits data further comprises at least one of an
3 indication to reduce the rate at which another MAC device transmits data, and an
4 indication to increase the rate at which another MAC device transmits data.

1 46. An apparatus comprising:
2 a means for receiving information indicating a need to change an amount of
3 data being transmitted through a first media access control (MAC)
4 device to a client of the first MAC device;
5 a means for forming a message including an indication to a second MAC
6 device to change a rate at which the second MAC device transmits
7 data; and
8 a means for transmitting the message to the second MAC device over a
9 network.

1 47. The apparatus of claim 46 wherein the network is at least one of a
2 metropolitan area network (MAN) and a resilient packet ring (RPR) network.

1 48. The apparatus of claim 46 wherein the message is a resilient packet ring
2 (RPR) fairness message.

1 49. The apparatus of claim 46 further comprising:
2 a means for determining an extent to which a data buffer associated with the
3 client of the first MAC device contains data; and
4 a means for preparing the information indicating the need to change the
5 amount of data being transmitted through the first MAC device to the
6 client of the first MAC device based on the extent to which the data
7 buffer associated with the client of the first MAC device contains data.

1 50. The apparatus of claim 46 wherein the message further includes a MAC
2 device address.

1 51. The apparatus of claim 46 wherein the indication to the second MAC
2 device to change the rate at which the second MAC device transmits data includes at
3 least one of: a MAC device address, a data transmission rate, a ramp factor, and a
4 flag.

1 52. The apparatus of claim 46 wherein the information indicating the need to
2 change the amount of data being transmitted through the first MAC device to the
3 client of the first MAC device includes at least one of: a data transmission rate, a
4 counter value, a message indicating that a buffer threshold has been exceeded, and a
5 signal from the client of the first MAC.

1 53. The apparatus of claim 46 wherein:
2 the information indicating the need to change the amount of data being
3 transmitted through the first MAC device to the client of the first MAC
4 device further comprises at least one of: information indicating the
5 need to reduce the amount of data being transmitted, and information
6 indicating the need to increase the amount of data being transmitted;
7 and
8 the indication to the second MAC device to change the rate at which the
9 second MAC device transmits data further comprises at least one of: an
10 indication to the second MAC device to reduce the rate at which the
11 second MAC device transmits data, and an indication to the second
12 MAC device to increase the rate at which the second MAC device
13 transmits data.

1 54. A computer readable medium comprising program instructions executable
2 on a processor, the computer readable medium being at least one of an electronic
3 storage medium, a magnetic storage medium, an optical storage medium, and a
4 communications medium conveying signals encoding the instructions, wherein the
5 program instructions are operable to implement each of:
6 receiving information indicating a need to change an amount of data being
7 transmitted through a first media access control (MAC) device to a
8 client of the first MAC device;

9 forming a message including an indication to a second MAC device to change
 10 a rate at which the second MAC device transmits data; and
 11 transmitting the message to the second MAC device over a network.

1 55. The computer readable medium of claim 54 wherein the network is at
 2 least one of a metropolitan area network (MAN) and a resilient packet ring (RPR)
 3 network.

1 56. The computer readable medium of claim 54 wherein the message is a
 2 resilient packet ring (RPR) fairness message.

1 57. The computer readable medium of claim 54 further comprising program
 2 instructions operable to implement:
 3 determining an extent to which a data buffer associated with the client of the
 4 first MAC device contains data; and
 5 preparing the information indicating the need to change the amount of data
 6 being transmitted through the first MAC device to the client of the first
 7 MAC device based on the extent to which the data buffer associated
 8 with the client of the first MAC device contains data.

1 58. The computer readable medium of claim 57 further comprising program
 2 instructions operable to implement:
 3 transmitting, to the first MAC device, the information indicating the need to
 4 change the amount of data being transmitted through the first MAC
 5 device to the client of the first MAC device.

1 59. The computer readable medium of claim 54 wherein the message further
 2 includes a MAC device address.

1 60. The computer readable medium of claim 59 wherein the MAC device
 2 address corresponds to one of the first MAC device, the second MAC device, and
 3 another MAC device.

1 61. The computer readable medium of claim 54 wherein the indication to the
 2 second MAC device to change the rate at which the second MAC device transmits

3 data includes at least one of: a MAC device address, a data transmission rate, a ramp
4 factor, and a flag.

1 62. The computer readable medium of claim 54 wherein the indication to the
2 second MAC device to change the rate at which the second MAC device transmits
3 data includes a data transmission rate, the method further comprising:
4 determining the data transmission rate.

1 63. The computer readable medium of claim 54 further comprising program
2 instructions operable to implement at least one of:
3 calculating the data transmission rate;
4 selecting a value for the data transmission rate; and
5 determining a ramp factor.

1 64. The computer readable medium of claim 54 further comprising program
2 instructions operable to implement:
3 transmitting the message from the second MAC device to a third MAC device.

1 65. The computer readable medium of claim 54 wherein the information
2 indicating the need to change the amount of data being transmitted through the first
3 MAC device to the client of the first MAC device includes at least one of: a data
4 transmission rate, a counter value, a message indicating that a buffer threshold has
5 been exceeded, and a signal from the client of the first MAC.

1 66. The computer readable medium of claim 54 wherein:
2 the information indicating the need to change the amount of data being
3 transmitted through the first MAC device to the client of the first MAC
4 device further comprises at least one of: information indicating the
5 need to reduce the amount of data being transmitted, and information
6 indicating the need to increase the amount of data being transmitted;
7 and
8 the indication to the second MAC device to change the rate at which the
9 second MAC device transmits data further comprises at least one of: an
10 indication to the second MAC device to reduce the rate at which the
11 second MAC device transmits data, and an indication to the second

12 MAC device to increase the rate at which the second MAC device
13 transmits data.